Lloyd's Register

Rules and Regulations for the Classification of Special Service Craft, July 2009

Notice No. 3

Effective Date of Latest Amendments:

See page 1

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RULES AND REGULATIONS FOR THE CLASSIFICATION OF SPECIAL SERVICE CRAFT,
July 2009

Notice No. 3

This Notice contains amendments within the following Sections of the *Rules and Regulations for the Classification of Special Service Craft, July 2009.* The amendments are effective on the dates shown:

Part	***Chapter***	***Section***	***Effective date***
1	3	2	1 July 2010
11	1	1, 2, 3, 4	1 July 2010
11	1	4	Corrigendum
11	2	4	1 July 2010
15	1	8	1 July 2010
16	1	1, 2, 6	1 July 2010
16	2	1, 3, 6, 7, 9, 10, 13, 14, 16, 17	1 July 2010

It will be noted that the amendments also include corrigenda, which are effective from the date of this Notice.

The *Rules and Regulations for the Classification of Special Service Craft, July 2009* are to be read in conjunction with this Notice No. 3. The status of the Rules is now:

Rules for Special Service Craft	Effective date:	July 2009
Notice No. 1	Effective dates:	1 January 2010 & Corrigenda
Notice No. 2	Effective dates:	1 July 2010
Notice No. 3	Effective dates:	1 July 2010 & Corrigendum

Part 1, Chapter 3

Periodical Survey Regulations for Service Craft

Effective date 1 July 2010

■ *Section 2*

Annual Surveys – Hull and machinery requirements

2.2 Annual Surveys

2.2.15 ~~For craft having **UMS** or **CCS** notation, a General Examination of automation equipment is to be carried out. Satisfactory operation of safety devices and control systems is to be verified.~~ For main propulsion, essential auxiliary and emergency machinery control engineering systems, a general examination of the equipment and arrangements is to be carried out. Records of modifications are to be made available for review by the attending Surveyor. The documentation required by Pt 6, Ch 1, including configuration management, are to be reviewed following system modifications. Satisfactory operation of the safety devices and control systems is to be verified. For craft having **UMS** or **CCS** notation, a general examination of the control engineering equipment required for these notations is also to be carried out.

Part 11, Chapter 1

Gearing

Effective date 1 July 2010

■ *Section 1*

General requirements

1.1 Application

1.1.2 The requirements of this Chapter, except where otherwise stated are applicable to electric motor, gas turbine and diesel engine gearing for driving:

(a) Conventional, totally submerged propeller(s)/impeller(s) for main propulsion purposes, for transmitted powers greater than 220 kW.
(b) Auxiliary machinery which is essential for the safety of the craft or for safety of persons on board where the transmitted powers exceed 110 kW.

NOTE
Alternatively calculations using the methods defined in ISO 6336 – *Calculation of load capacity of spur and helical gears* will be considered.

■ *Section 2*

Particulars to be submitted

2.2 Plans

2.2.1 **Gearing:**

(a) Cross sectional views indicating general arrangement.
(b) Detailed plans of elements.

2.2.2 **Shafting and auxiliary systems:**

(a) Mass elastic schematic showing gear unit torsional data.
(b) Arrangements plan indicating bearing positions.
(c) Detailed plans indicating scantlings of shafts, couplings and bolting.
(d) Schematic plans of the lubricating oil system, together with pipe material, relief valve and working pressures.
(e) Schematic of the control and electrical system.

2.3 Information

2.3.1 **Gearing:**
♣ (a) Operational power/speed envelope for each pinion.
♣ (b) Number of teeth in each gear.
♣ (c) Reference diameters.
♣ (d) Helix angles at reference diameters.
♣ (e) Normal pitches of teeth at reference diameters.
♣ (f) Tip diameters.
♣ (g) Root diameters.
♣ (h) Face widths and gaps, where applicable.
♣ (j) Pressure angles of teeth (normal or transverse) at reference diameters.
♣ (k) Accuracy grade Q in accordance with ISO 1328 or an equivalent Standard.
♣ (l) Surface texture of tooth flanks and roots.
♣ (m) Minimum backlash.
♣ (n) Centre distance.
♣ (o) Basic rack tooth form.
♣ (p) Protuberance and final machining allowance.
♣ (q) Details of post hobbing processes, if any.
♣ (r) Details of tooth flank corrections, if adopted.
♣ (s) Case depth for surface-hardened teeth.
♣ (t) Shrinkage allowance for shrunk-on rims and hubs.
♣ (u) Type of coupling proposed for oil engine applications.
♣ (v) Details of surface treatment.
♣ (w) Additional measures, not covered by the Rules, taken during manufacture of the gear elements, to improve the load capacity of the gear teeth.
♣ (x) Calculations for short term high power operation, where applicable, *see* Part 9.
♣ (y) Failure mode effects analysis as required by Part 9.
♣ (z) Specifications for carbon-manganese and alloy steel forging materials of pinions, pinion sleeves, wheel rims, gear wheels, couplings, bolting and all transmission shafting, giving chemical composition, heat treatment and mechanical properties.

2.3.2 **Shafting and auxiliary systems:**
♣ (a) Details of clutch units, where fitted.
♣ (b) Details of alarms and control systems, where fitted.
♣ (c) Schematic plans of the lubricating oil system, together with pipe material, relief valve and working pressures.

■ *Section 3*
Materials

3.1 Requirements and specifications

3.1.2 ~~Manufacturers' test~~ Manufacturer's certificates for forgings may be accepted where the transmitted power does not exceed 220 kW, *see* Ch 1,3.1.3(b) of the Rules for Materials.

■ *Section 4*
Design of gearing

4.1 Symbols

(*Part only shown*)
4.1.1 The following symbols apply:
h_F = bending moment arm for root stress, in mm
h_W = sum of actual tooth addenda of pinion and wheel, in mm
m_n = normal module, in mm

CORRIDENDUM

Q = accuracy grade derived from ISO 1328 – ~~1975~~ *Cylindrical gears - ISO system of accuracy*.

Effective date 1 July 2010

4.12 Backlash

4.12.1 The normal backlash between any pair of gears should not be less than:

$$\frac{a\alpha_n}{90\ 000} + 0{,}1 \text{ mm}$$

4.12.2 The normal backlash is not to exceed three times the value calculated in 4.12.1.

~~4.12~~ 4.13 Alignment

Existing paragraphs 4.12.1 *and* 4.12.2 *have been renumbered* 4.13.1 *and* 4.13.2.

Part 11, Chapter 2

Shafting Systems

Effective date 1 July 2010

■ *Section 4*
Design and construction

4.4 Screwshafts and tube shafts

4.4.8 The diameter of ~~the~~ unprotected ~~screwshaft~~ screwshafts of materials having properties as shown in Table 2.4.1 forward of the forward stern tube seal ~~need not be greater than the diameter as required by 4.4.6~~ is to be determined in accordance with 4.4.7 or 4.4.3, whichever is less.

Part 15, Chapter 1

Piping Design Requirements

Effective date 1 July 2010

■ *Section 8*
Plastics

8.2 Design and performance criteria

8.2.4 Plastics piping is to be electrically conductive when:

(a) Carrying fluids capable of generating electrostatic charges.

(b) Passing through ~~dangerous~~ hazardous zones and spaces, regardless of the fluid being conveyed.

Suitable precautions against the build up of electrostatic charges are to be provided in accordance with the requirements of 8.5, *see also* Pt 16, Ch 2,1.12.

Part 16, Chapter 1

Control Engineering Systems

Effective date 1 July 2010

■ *Section 1*
General requirements

1.2 Plans and information

1.2.5 **Programmable electronic systems**.
(In addition to the documentation required by 1.2.2)

- System requirements specification.
- System integration plan, *see* 2.13.2.
- Failure Mode and Effects Analysis (FMEA), *see* 2.13.5.
- Details of the hardware configuration in the form of a system block diagram, including input/output schedules.
- Hardware certification details, *see* 2.10.5 and 2.12.3.
- Software quality plans, including applicable procedures, *see* ~~2.10.21~~ 2.10.25.
- Factory acceptance, integration and sea trial test schedules for hardware and software.
- Details of data storage arrangements, *see* 2.10.10 and 2.12.6.

■ *Section 2*
Essential features for control, alarm and safety systems

2.10 Programmable electronic systems – General requirements

2.10.8 Means are to be provided to recover or replace data required for safe and effective system operation lost as a result of component failure. The submission required by 1.2.5 is to address reinstatement of system operation following data loss.

~~*2.10.8*~~ *2.10.9* System configuration, programs and data are to be protected against loss or corruption in the event of failure of any power supply. For essential services and safety critical systems, *see* 2.12.6.

2.10.10 Where it is necessary to store data required for system operation in volatile memory, a back-up power supply is to be provided that prevents data loss in the event of loss of the normal power supply. The submission required by 1.2.5 is to include details of any routine maintenance necessary and the measures necessary to restore system operation in the event of data loss as a result of power supply failure.

2.10.11 Back-up power supplies required by 2.10.10 are to be rated to supply the connected load for a defined period of time that allows sufficient time to restore the supply in the event of loss of the normal power supply as a result of failure of a main source of electrical power. This period is not to be less than 30 minutes.

2.10.12 Where regular battery replacement is required to maintain the availability of volatile memory back-up power supply required by 2.10.10, these are to be included in the schedule of batteries required by Ch 2,1.2.7 and 11.7, irrespective of battery type and size. Applicable entries in this schedule are to note that these batteries are not for safety critical systems or essential or emergency services.

Existing paragraphs 2.10.9 *to* 2.10.21 *have been renumbered* 2.10.13 *to* 2.10.25.

2.12 Programmable electronic systems – Additional requirements for essential services and safety critical systems

2.12.6 Volatile memory is not to be used to store data required for:
- an essential service or safety critical functions; or
- ensuring safety or preventing damage, including during start-up or re-start.

Alternative proposals which demonstrates that an equivalent level of system integrity will be achieved may be submitted for consideration.

Existing paragraphs 2.12.6 *to* 2.12.9 *have been renumbered* 2.12.7 *to* 2.12.10.

■ *Section 6*
Trials

6.1 General

6.1.3 Acceptance tests and trials for Programmable Electronic Systems are to include verification of software lifecycle activities appropriate to the stage in the system's lifecycle at the time of system examination. The documentation required by 1.2.5 is to be in accordance with the current configuration and the testing and trials are to address software modifications and configuration management procedures to the Surveyor's satisfaction.

Part 16, Chapter 2

Electrical Engineering

Effective date 1 July 2010

■ *Section 1* General requirements

1.2 Plans

1.2.7 A schedule of batteries fitted for use for emergency and essential services, giving details of:

- type and manufacturer's type designation;
- voltage and ampere-hour rating;
- location;
- equipment and/or system(s) served;
- maintenance/replacement cycle dates;
- date(s) of maintenance and/or replacement; and
- for replacement batteries in storage, the date of manufacture and shelf life, with accompanying battery replacement procedure documentation to show compliance with ~~11.8~~ 11.7.

1.2.8 Details of electrically-operated fire, craft, crew and passenger emergency safety systems which are to include typical single line diagrams and arrangements, showing main vertical and, where applicable, horizontal fire zones and the location of equipment and cable routes, including identification of relevant high ~~risk~~ fire risk areas, to be employed for:

(a) emergency lighting;
(b) accommodation fire detection, alarm and extinction systems;
(c) fixed water-based local application fire-fighting systems;
(d) public address system;
(e) general alarm;
(f) watertight doors, shell doors and other electrically operated closing appliances; and
(g) low location lighting.

~~NOTE~~

A general arrangement plan of the complete craft showing the main vertical fire zones and the location of equipment and cable routes, including identification of relevant high ~~risk~~ fire risk areas, for the above systems, is to be made available for the use of the Surveyor on board.

1.2.14 For non-metallic cable support systems or protective casings, test evidence, details of installation procedures and manufacturer's recommendations that show compliance with 10.13.

1.3 Surveys

1.3.3 For electric propulsion systems, in addition to the equipment listed in 1.3.2, the following equipment is to be surveyed by the Surveyors during manufacture and testing:

- exciters;
- filters;
- reactors;
- dynamic braking assemblies; ~~and~~
- pre-magnetisation transformers; and
- slip ring assemblies.

1.4 Additions or alterations

1.4.4 Proposed modifications to the electrical protection systems are to be developed in accordance with 6.1.4 and plans submitted are also to address the updating of approved version of the details required by 1.2.3 and 1.2.4.

Existing paragraph 1.4.4 *has been renumbered* 1.4.5.

1.11 Earthing of non-current carrying parts

1.11.3 Where extraneous-conductive parts (i.e. parts not forming part of the electrical installation and liable to introduce an electric potential) are not bonded by separate earthing conductors, details are to be submitted that demonstrate that a permanent, metal-to-metal connection of negligible impedance, which will not degrade due to corrosion or vibration, will be achieved.

~~*1.11.3*~~ *1.11.4* Armouring, braiding and other metal coverings of cables are to be effectively earthed. Where the armouring, braiding and other metal coverings are earthed at one end only, they are to be adequately protected and insulated at the unearthed end with the insulation being suitable for the maximum voltage that may be induced. *See* 13.1 for earthing of cables in ~~dangerous~~ hazardous zones or spaces.

Existing paragraphs 1.11.4 *to* 1.11.8 *have been renumbered* 1.11.5 *to* 1.11.9.

1.16 Programmable electronic systems

1.16.1 Where programmable electronic systems are implemented and used to control the electrical installation, or to provide safety functions in accordance with the requirements of this Chapter (e.g. electric propulsion, circuit-breaker settings, switchgear and control gear controllers, etc.), the arrangements are to satisfy the applicable requirements of Ch 1,2.10 to 2.13.

1.16.2 Where 1.16.1 applies, proposed modifications to software and acceptance testing and trials are to be in accordance with Ch 1,1.4 and Section 7 as applicable.

Section 3
Emergency source of electrical power

3.2 Emergency source of electrical power in passenger craft and for yachts that are 500 gt or more

(*Part only shown*)

3.2.7 The electrical power available is to be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power is to be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

(e) for a period of 10 min~~:~~
  ~~(i)~~ , power drives for directional control devices including those required to direct thrust forward and astern, unless there is a manual alternative complying with Pt 14, Ch 1,6.1.4~~, and~~;

(f) for a period of half an hour;
  (i) any watertight doors required by Chapter 2 to be power operated together with their control, indication and alarm signals;
  (ii) the emergency arrangements to bring the lift cars to deck level for the escape of persons. The passenger lift cars may be brought to deck level sequentially in an emergency~~.~~;

(g) ~~Where~~ where applicable, the services required by 2.3.2~~.~~; and.

(h) where applicable, the air compressors for breathing apparatus cylinders referred to in 16.10.1.

3.2.9 The transitional source of emergency electrical power required by 3.2.8 may consist of an accumulator battery suitably located for use in an emergency which is to operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and so arranged as to supply automatically in the event of failure of either the main or emergency source of electrical power for half an hour at least the following services, if they depend upon an electrical source for their operation:

(a) ~~for half an hour:~~
  (i) the lighting required by 3.2.7(a) and (b);
  (ii) the services required by 3.2.7(c)(i), (iii) and (iv) unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency;

(b) with respect to watertight doors:
  (i) power to operate the watertight doors but not necessarily simultaneously, unless an independent temporary source of stored energy is provided. The power source should have sufficient capacity to operate each door at least three times i.e. closed-open-closed, against an adverse list of 15°;
  (ii) power to the control, indication and alarm circuits for the watertight doors~~ for half an hour~~.

3.2.17 A lesser period than the 36 hour period specified in 3.2.7, but not less than 18 hours, may be considered for yachts of 500 gt or more when in accordance with the relevant Statutory Regulations of the National Authority of the country in which the craft is to be registered.

3.3 Emergency source of electrical power in craft required to comply with the HSC Code

3.3.9 The transitional source of emergency electrical power where required by 3.3.8 is to consist of an accumulator battery suitably located for use in an emergency which is to operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and is to be so arranged as to supply automatically in the event of failure of either the main or the emergency source of electrical power for half an hour at least the following services if they depend upon an electrical source for their operation:

(a) ~~for half an hour:~~
  (i) the lighting required by 3.3.7(a) and (b). For this transitional phase, the required emergency electric lighting, in respect of the machinery space and accommodation and service spaces, may be provided by permanently fixed, individual, automatically charged, relay operated accumulator lamps; and
  (ii) the services required by 3.3.7(b) and (c);

(b) with respect to watertight doors:
  (i) power to operate the watertight doors but not necessarily simultaneously, unless an independent temporary source of stored energy is provided. The power source should have sufficient capacity to operate each door at least three times, i.e. closed-open-closed, against an adverse list of 15°; and
  (ii) power to the control, indication and alarm circuits for the watertight doors~~ for half an hour~~.

Alternatively, the above services may have independent supplies, for the period specified, from accumulator batteries suitably located for use in an emergency.

3.4 Emergency source of electrical power in cargo craft, patrol and pilot craft, workboats and other similar craft of 500 tons gross tonnage and above; and cargo craft, patrol and pilot craft, workboats and other similar craft of less than 500 tons gross tonnage for operation in Service Groups 4 to 6

(*Part only shown*)

3.4.3 The electrical power available is to be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power is to be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

(a) for a period of three hours, emergency lighting at every ~~lifeboat~~ survival craft preparation station, muster and embarkation station and over the sides;

■ *Section 6*
System design – Protection

6.1 General

6.1.4 Protection systems are to be developed using a systematic design procedure incorporating verification and validation methods to ensure successful implementation of the requirements above. Details of the procedures used are to be submitted when requested. An approved copy of the details required by 1.2.3 and 1.2.4 is to be retained on board and made available to the Surveyor on request.

■ *Section 7*
Switchgear and control gear assemblies

7.3 Circuit-breakers

7.3.5 Where the means of setting adjustable protection characteristics are not durably marked and locked in position and cannot be visually inspected (e.g. electronic storage), the settings of characteristics are to be recorded and a copy of the records included in the details retained on board, *see* 6.1.4.

7.11 Instruments for alternating current generators

7.11.4 The indicators and displays required by 7.11.1 to 7.11.3 are to be located and arranged such that they may be viewed at a single operating position. Where manual paralleling is provided, it is to be possible to adjust voltage and frequency at this position.

Existing paragraph 7.11.4 *has been renmbered* 7.11.5.

■ *Section 9*
Converter equipment

9.1 Transformers

9.1.12 The following tests are to be carried out on all transformers at the manufacturer's works, and a certificate of tests issued by the manufacturer, *see also* 1.3.2 and 1.3.3:

(a) measurement of winding resistances, voltage ratio, impedance voltage, short circuit impedance, insulation resistance, load loss, no load loss and current;
(b) dielectric tests;
(c) temperature rise test on one transformer of each size and type~~.~~ ; and
(d) where evidence of compliance with 9.1.9 is not submitted for consideration, short-circuit withstand on one transformer of each size and type.

■ *Section 10*
Electrical cables and busbar trunking systems (busways)

10.8 Installation of electric cables

10.8.7 Cables having ~~a bare~~ an exposed metallic screen, braid or armour are to be installed in such a manner that galvanic corrosion by contact with other metals is prevented. Sufficient measures are also to be taken to prevent damage to ~~any bare~~ exposed galvanised coatings during installation.

10.8.8 ~~Consideration is to be given to providing adequate protection~~ Protection is to be provided for cable oversheaths in areas where cables are likely to be exposed to damaging substances under normal circumstances or areas where the spillage or release of harmful substances is likely.

10.9 Mechanical protection of cables

~~*10.9.3* Non-metallic protective casings and fixings are to be flame retardant in accordance with the requirements of IEC 60092-101.~~

Existing paragraph 10.9.4 *has been renumbered* 10.9.3.

10.10 Cable support systems

10.10.2 Cable support systems, which may be in the form of trays or plates, separate support brackets, hangers or ladder racks, together with their fixings and accessories, are to be robust and are to be of corrosion-resistant material or suitably corrosion inhibited before erection. ~~Where cable support systems are manufactured of plastics materials, evidence of satisfactory type testing in accordance with an acceptable test procedure is to be submitted for consideration.~~ The cable support system is to be effectively secured to the craft's structure, the spacing of the fixings taking account of the probability of vibration and any heavy external forces, e.g. where located in areas subject to impact by sea-water.

~~*10.10.5* Where the cable support system or fixings are manufactured from a material other than metal, suitable supplementary metallic fixings or straps spaced at regular distances are to be provided, such that, in the event of a fire or failure, the cable support system and the cables affixed to it are prevented from falling and causing an injury to personnel and/or an obstruction to any escape route. Alternatively, the cables may be routed away from such areas.~~

~~*10.10.6* Cable support systems manufactured of plastics materials installed on the open deck are to be protected from degradation caused by exposure to solar radiation.~~

Existing paragraph 10.10.7 *has been renumbered* 10.10 5.

10.12 Installation of electric cables in protective casings

~~*10.12.2* When protective casings are secured by means of clips or straps manufactured from a material other than metal the fixings are to be supplemented by suitable metal clips or straps spaced at regular distances each not exceeding 2 m.~~

Existing paragraphs 10.12.3 *to* 10.12.8 *have been renumbered* 10.12.2 *to* 10.12.7.

10.13 Non-metallic cable support systems, protective casings and fixings

10.13.1 Where it is proposed to use non-metallic cable support systems, protective casings or fixings, the additional requirements of this sub-Section apply. For high voltage installations, metallic protective casings are required where 10.8.14(b) applies.

10.13.2 Non-metallic cable support systems and protective casings are to be installed in accordance with the manufacturer's recommendations. The support systems and protective casings are to have been tested in accordance with an acceptable test procedure for:
(a) ambient operating temperatures;
(b) safe working load;
(c) impact resistance;
(d) flame retardancy;
(e) smoke and toxicity; and
(f) use in explosive gas atmospheres or in the presence of combustible dusts, electrical conductivity;
with satisfactory results.

10.13.3 Non-metallic cable support systems, protective casings and fixings installed on the open deck are to be protected from degradation caused by exposure to solar radiation.

10.13.4 Where the cable support system, protective casing or fixings are manufactured from a material other than metal, suitable supplementary metallic fixings or straps spaced at regular distances are to be provided such that, in the event of a fire or failure, the cable support system, protective casing and the affixed cables are prevented from falling and causing an injury to personnel and/or an obstruction to any escape route. Alternatively, the cables may be routed away from such areas.

10.13.5 The load on non-metallic cable support systems or protective casings is not to exceed the tested safe working load.

10.13.6 When a cable support system or protective casing is secured by means of clips or straps manufactured from a material other than metal the fixings are to be supplemented by suitable metal clips or straps spaced at regular distances each not exceeding 2 m and, for non-metallic cable support systems or protective casing, that used during safe working load testing.

10.13.7 Non-metallic fixings are to be flame retardant in accordance with the requirements of IEC 60092-101, or an alternative, relevant National or International Standard.

Existing sub-Sections 10.13 *to* 10.16 *have been renumbered* 10.14 *to* 10.17.

■ *Section 13*
Electrical equipment for use in explosive atmospheres

13.1 General

13.1.2 The installation of electrical equipment in spaces and locations in which flammable mixtures are liable to collect, e.g. areas containing flammable gas or vapour and/or combustible dust, are, to comply with the relevant requirements of Pt 6, Ch 2,13 of the *Rules and Regulations for the Classification of Ships*.

Existing paragraphs 13.1.2 *and* 13.1.3 *have been renumbered* 13.1.3 *and* 13.1.4*.*

■ *Section 14*
Navigation and manoeuvring systems

14.3 Navigation lights

14.3.1 Navigation lights are to be connected separately to a distribution board reserved for this purpose only and accessible to the officer of the watch. This distribution board is to be connected directly or through transformers to the emergency source of electrical power in compliance with, for passenger craft, 3.2.7(b)(i) and (ii) and 3.2.9(a) or, for cargo craft, 3.3.8(b)(i) and (ii) and 3.3.8(a). An alarm is to be activated in the event of failure of a power supply from the distribution board.

14.3.3 Provision is to be made on the navigating bridge for the navigation lights to be transferred to an alternative circuit fed from the main source of electrical power.

Existing paragraphs 14.3.3 *to* 14.3.5 *have been renumbered* 14.3.4 *to* 14.3.6.

~~*14.3.6* Provision is to be made on the navigating bridge for the navigation lights to be transferred to an alternative circuit fed from the main source of electrical power.~~

14.3.7 Navigation light power supply units installed to convert, control and/or monitor the distribution board power supply required by 14.3.1 above for connection to the light source(s) (e.g. for LED type navigation lights) are, in the event of a short-circuit on the unit output, are to disconnect or limit the supply to prevent further damage and activate an alarm in the event of a short-circuit on the unit output side.

14.3.8 Navigation light power supply units are to be self-checking, detecting failures of the unit itself and activating an alarm. These are to include:

- detection of system lock-ups (program hangs);
- means to detect whether navigation light switching command input circuits or links; and
- means to detect failure of the navigation light monitoring arrangements required to provide the alarms required by 14.3.4 and 14.3.5, as applicable.

14.3.9 The navigation light power supply failure alarms required by 14.3.1 are not to be displayed as a group alarm. Other navigation light alarms may be grouped for each navigation light where means are provided for personnel to determine the cause of the alarm. Activation of more than one of the navigation light alarms as a result of a single failure is to be prevented.

Existing paragraph 14.3.7 *has been renumbered* 14.3.10*.*

■ *Section 16*
Fire safety systems

16.1 Fire detection and alarm systems

16.1.3 Fire detection systems within the accommodation spaces and cabin balconies are, in addition to the requirements of Chapter 1, as applicable, to comply with 16.1.4 to ~~16.1.15~~ 16.1.17.

16.1.5 Detectors and manually operated call points are to be grouped into sections. The activation of any detector or manually operated call point is to initiate a visual and audible fire signal at the control panel and indicating units. If the signals have not received attention within two minutes an audible alarm is to be automatically sounded throughout the crew accommodation and service spaces, control stations and machinery spaces of Category A. For craft required to comply with the HSC Code, there is to be no time delay for the audible alarms in crew accommodation areas when all the control stations are unattended. This alarm sounder system need not be an integral part of the detection system.

16.1.6 ~~Indicating~~ In yachts, the fixed fire detection and fire alarm system is to be capable of remotely and individually identifying each detector and manually operated call point. On other craft, indicating units are to denote, as a minimum, the section in which a detector or manually operated call point has operated. At least one unit is to be so located that it is easily accessible to responsible members of the crew. One indicating unit is to be located on the navigating bridge if the control panel is located in the central control station.

16.1.7 Clear information is to be displayed on or adjacent to each indicating unit about the spaces covered and the location of the section and, for yachts, each detector and manually operated call point.

16.1.8 Where the fire detection system does not include means of remotely identifying each detector and manually operated call point individually no section covering more than one deck within accommodation, service spaces and control stations is normally to be permitted except a section which covers an enclosed stairway. The number of enclosed spaces in each section are to be limited to the minimum considered necessary in order to avoid delay in identifying the source of fire. In no case are more than fifty spaces permitted in any section.

16.1.9 In passenger craft other then yachts, where the fire detection system does not include means of remotely identifying each detector individually a section of detectors is neither to serve spaces on both sides of the craft nor on more than one deck except when permitted by ~~16.1.4~~ 16.1.14.

16.1.10 A section of fire detectors and manually operated call points which covers a control station, a service space or an accommodation space is not to include a machinery space of Category A.

16.1.11 The fire detection system is not to be used for any other purpose, except that closing of fire doors and similar functions may be permitted at the control panel. For craft required to comply with the HSC Code, the control panel may be used to activate a paging system, fan stops, closure of fire doors, closure of fire and smoke dampers, and/or a sprinkler system.

16.1.12 A loop circuit of an addressable fire detection system, capable of remotely identifying from either end of the loop, individually each detector and manually operated call point served by the circuit, may serve spaces on both sides of the craft and on several decks, but is not to be situated in more than one main vertical or horizontal fire zone, nor is a loop circuit which covers ~~a control station or an accommodation space~~ an accommodation space, service space and/or control station to include a machinery space of Category A.

16.1.13 A loop circuit of an addressable fire detection system may comprise one or more sections of detectors and manually operated call points. Where the loop comprises more than one section, the sections are to be separated by devices which will ensure that if a short-circuit occurs anywhere in the loop, only the affected section of detectors and manually operated call points will be isolated from the control panel. No section of detectors and manually operated call points is in general to include more than 50 detectors.

16.1.14 A section of fire detectors and manually operated call points is not to be situated in more than one main vertical or horizontal fire zone. Additionally, for craft required to comply with the HSC Code, a section of detectors and manually operated call points section of detectors of an addressable fire detection system is neither to serve spaces on both sides of the craft nor on more than one deck, except that:

(a) a section of detectors and manually operated call points may serve spaces on more than one deck if those spaces are located in either the fore or aft end of the craft, or they constitute common spaces occupying several decks, i.e. public spaces, enclosed stairways, etc.

(b) in craft of less than 20 m in breadth, a section of detectors and manually operated call points may serve spaces on both sides of the craft.

16.1.15 The wiring for each section of detectors and manually operated call points in an addressable fire detector system is to be separated as widely as practicable from that of all other sections on the same loop. When this is not practical, such as in large public spaces, the part of the loop which by necessity passes through the space for a second time is to be installed at the maximum possible distance from other parts of the loop.

16.1.17 Detectors fitted in cabins on yachts, when activated, are also to be capable of emitting, or cause to be emitted, an audible alarm within the space where they are located.

16.3 Fixed water-based local application fire-fighting systems

(*Part only shown*)
16.3.10 The evidence required by 16.3.9 is to demonstrate the safe and effective operation of the overall arrangements in the event of system operation. This evidence is to demonstrate that exposure to system spray and/or water:

- cannot result in loss of essential services (~~i.e.~~ e.g. unintended activation of automatic machinery shut-down ~~due to sensor failure~~);

16.6 Fire safety stops

16.6.6 In passenger craft carrying ~~more than~~ 36 passengers or more with main laundries, ~~any~~ electrically operated fire dampers ~~required to be~~ fitted at the lower end of the laundry exhaust ducts ~~by~~ required to comply with relevant statutory regulations are to be fitted with additional remote-control arrangements for shutting off the exhaust fans and supply fans and operating the fire dampers from within the space.

16.8 Fire dampers

16.8.3 In passenger craft carrying ~~more than~~ 36 passengers or more with main laundries, ~~any~~ where electrically operated fire dampers are required ~~by~~ to comply with relevant statutory regulations to be fitted at the lower end of exhaust ducts from any main laundries, they are to be capable of automatic and remote operation.

16.8.4 For craft required to comply with the HSC Code with galley range exhaust ducts, electrically operated fire dampers fitted in the lower or upper end of the duct are to be remotely operated and, additionally, the fire damper at the lower end of the duct is to be automatically operated.

16.10 Electrically powered air compressors for breathing air cylinders

16.10.1 In yachts that are 500 gt or more carrying more than 36 passengers where electrically powered air compressors are installed as part of the means required by the National Administration, for recharging breathing apparatus air cylinders for fire-fighter's outfits, the compressors are to be supplied by the main and emergency sources of electrical power. Details of the emergency supply electrical load, supply changeover arrangements and operation under fire conditions are to be submitted for consideration. The arrangements are to be to the satisfaction of the National Administration with which the craft is registered.

Section 17

Crew and passenger emergency safety systems

17.2 General emergency alarm system

17.2.4 There are to be segregated cable routes to public rooms, alleyways, stairways, ~~and~~ control stations and on passenger craft on open decks, so arranged that any single electrical fault, localised fire or casualty will not cause the loss of the facility to sound the general emergency alarm in any public rooms, alleyways, stairways, ~~and~~ control stations and on passenger craft on open decks, ~~be it~~ albeit at a reduced capacity.

Cross-References

Section numbering in brackets reflects any Section renumbering necessitated by any of the Notices that update the current version of the Rules for Special Service Craft.

Part 16, Chapter 1

2.10.6	*Reference* 2.12.8 *now reads* 2.12.9.
2.12.1	*Reference* 2.12.9 *now reads* 2.12.10.
2.13.7	*Reference* 2.10.19 and 2.10.20 *now reads* 2.10.23 and 2.10.24.

Part 16, Chapter 2

1.4.4	*Reference* 14.3.4 and 14.3.5 *now reads* 14.3.5 and 14.3.6.
1.10.7	*Reference* 10.14 *now reads* 10.15.
1.12.3	*Reference* 1.11.6 and 1.11.8 *now reads* 1.11.7 and 1.11.9.
10.1.1	*Reference* 10.15 *now reads* 10.16.
10.6.5	*Reference* 1.11.7 *now reads* 1.11.8.
10.8.17	*Reference* 10.13 *now reads* 10.14.
10.16.1	*Reference* 10.16.2 to 10.16.6 *now reads* 10.17.2 to 10.17.6.
14.3.4 ***(14.3.5)***	*Reference* 1.4.4 *now reads* 1.4.5. *Reference* 14.3.3 *now reads* 14.3.4.
14.3.5 ***(14.3.6)***	*Reference* 14.3.4 *now reads* 14.3.5.

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